

enough, but far more obscure is the question, who were this old dark-haired race of Silurians? The author, touching on the theory connecting them with Iberians or Basques, is quite alive to the slightness of the evidence pointing this way, and not less cautious as to the ancient words belonging to præ-Keltic tribes said to be preserved in Irish or Welsh.

Mr. Elton's department of original research lies especially in ancient legal customs, on which he has for years been the leading authority at the English Bar. Indeed the desire to get back to the historical meaning of customs which the law-books utterly fail to explain, is plainly the motive which has led him into the wider investigations embodied in this book. Naturally he is always on the look-out for legal relics of the earlier inhabitants, and for instance makes a striking remark on the succession of Pictish kings being not from father to son, but to the nearest male relative traced through the female line. This custom of kinship through the mother, which still marks many of the lower tribes of mankind, did not belong to the Kelts, who shared with other Aryans the rule of descent on the father's side, and it is fairly argued that the squalid tattooed Picts were of an older race, and kept up their ruder law of marriage. Again, the ancient custom still prevailing in many English districts, in the Vale of Taunton for instance, that the land goes not to the eldest but the youngest son, is here discussed more fully than it ever has been. The author's view is that whereas in the Aryan nations the eldest son's birthright was connected, as in India at this day, with the duty of keeping up the offerings to the divine ancestors, so the opposite custom of youngest-right may have come down from the religion of some ancient race in England, where, as among the Mongols still, the youngest son was the "fire-keeper" and inherited the home. In Germany, youngest-right is frequent and there it is on record that that quaint fetish or idol the mandrake root, dug up from under the gallows, half human in form and possessed by its familiar demon, used to descend at the house-father's death to the youngest son, on condition of his performing the pagan rite of burying bread and money in the grave. This is an interesting argument, though perhaps it may be answered that in new countries where the sons as they grow up go out and make homes of their own, the youngest son is the natural caretaker and heir of the parent's house and fields, and it is as likely that he performed the religious duties because living there made him the proper person, as that he became the heir because he had to perform the religious duties. How monuments and rites of older tribes find new and changed places in the religion of their conquerors, is here often brought into view. St. Boniface found the Frieslanders using as an altar a rude stone dolmen, probably a tomb built ages earlier by bronze-age inhabitants; the fierce Teutons would make a captive creep through the narrow opening of the upright stones, and then "sent him to Woden." After this, it does not seem surprising that our country folk should believe the rude stone dolmens on our hill-sides to have been altars for human sacrifice. Among earlier rites lasting on into Christianity, one of the most picturesque is that of Brighid the Keltic fire-god's daughter, who passed into St. Bridget, patron saint of Ireland and still name-giver to Biddy the typical Irish housemaid.

But St. Bridget held to her old goddess-nature, and till the suppression of the monasteries her everlasting fire was kept up at Kildare by her nineteen nuns, who might not defile by blowing with their breath the flame sacred to the "woman of the mighty roarings"; each nun tended the fire one night in turn, but on the twentieth she who went off duty said "Brigit! take care of your own fire, for this night belongs to you." We are puzzled by Mr. Elton's remarks on the worship of Mithra, that ancient Aryan solar deity whose Oriental worship became so popular in Britain during the Roman occupation. The usually-known evidence seems to imply that the Mithra-worshippers fixed his divine birthday, the "Dies Natalis invicti Solis," on December 25, because the sun's birth would naturally be at the winter solstice, while it was not till long afterwards that this appropriate date was adopted for the Christian Dies Natalis, Christmas Day. Mr. Elton appears to take it the other way, as though the Mithra-worshippers for the sake of popularity borrowed the festival from the Christians. If he has some new evidence in this direction, it ought to be carefully gone into, and at any rate it will be well to clear the point up in the next edition.

What has now been said will give an idea of the more special researches in this important work. Readers of this journal will not disapprove of our having passed over weighty but ordinary historical topics, such as the invasions of Britain by Romans and Saxons, in order to give space for tracing lines of beliefs and customs. Some of these may seem trifling, but in the scientific study of history every trifle tells which can show a line of continuity from age to age and from race to race.

EDWARD B. TYLOR

WORKS ON THE MICROSCOPE

The Microscope and its Revelations. By William B. Carpenter, M.D., LL.D., C.B., F.R.S. Sixth Edition. Illustrated by 500 Wood Engravings and Twenty-six Plates. (London: J. and A. Churchill, 1881.)

Practical Microscopy. By George E. Davis, F.R.M.S., &c. Illustrated with 257 Woodcuts and a Coloured Frontispiece. (London: David Bogue, 1882.)

DR. CARPENTER is to be congratulated on the recent publication of the sixth edition of his very useful work on the Microscope and its Revelations, the more especially as now having the command of his own time, this edition is not only the expression throughout of his own matured views, but also contains a large amount of new matter.

A work like this which has proved itself so great a favourite needs but a brief notice at our hands. It is without doubt the book for the English reader to buy, who wishes to work as an amateur with the microscope; and should any such proceed further with the study, and penetrate into the mysteries of animal or plant life, he will find himself none the worse, but a great deal the better for the lessons he will have learnt in these pages.

The general plan of Dr. Carpenter's book is good; it begins with a short chapter on the Optical Principles of the Microscope. The question of there being a limit to the magnifying powers of the object-glasses, or whether there is a minimum behind which nothing can be seen, is not entered upon. The next two chapters—on the Construc-

tion of the Microscope and its Accessories—give a sketch of all the principal stands and apparatus in connection therewith; and is followed by two more, giving excellent directions for the management of the microscope, and for the preparation, mounting, and collecting of microscopical objects.

The second portion of the volume is devoted to an account of some of the more interesting forms of minute life to be met with, both in the animal and vegetable kingdoms. As this portion of the volume travels over a very wide field of research, so it is here that the greatest opportunities for criticism present themselves, but it is just to remark, that, despite the wonderful revolutions that have occurred in the domain of biology within the last few years, and despite the difficulty of keeping ever on a level with modern advances, a struggle only ending with one's life, Dr. Carpenter shows not only a wondrous energy, but a positive freshness in the adopting of new views. The notes on the green chromules of plant-cells are not quite up to the modern researches of Pringsheim, and we regret to find the author's sanction given to the use of the term *Gonidia* for the products of free cell-formation in the Cryptogams. The paragraph on the Nostocs might advantageously have been improved. No reason is given for uniting the Batrachospermæ with the Florideæ. The chapter on protophyte and other fungi, seems very carefully written: the position of the myxomycetes is left doubtful, but Chlamydomyxa is brought into the same chapter. The new views on lichens are accepted, but the vacant space on the page which meets the view, might well have been occupied with a list of the algæ which play the part of hosts to the lichen fungi, which list would have proved, we think, that these forms do furnish objects of special interest, even to the ordinary microscopical worker, Dr. Carpenter's assertion notwithstanding.

It seems improbable that the antherozoids represented on page 396 as escaping from the Clpidium-like cell in the ultimate cell of the lateral branchlet of *Sphacelaria tribuloides* belong to the plant, and it is a pity that no illustration of a trichogyne is given in the account of the Florideæ, so as to call the reader's attention to what he may expect to see when looking for this special often rapidly-disappearing hair-cell. Nor is the open trichogyne in the easily procurable *Coleochæta* alluded to. Very scant justice is done to the Rhizocarps, and the true significance of the growth of the embryo in Lycopods appears to us to be overlooked.

Elfvig's researches on the vegetative cells in the pollen-plants of the Angiosperms surely ought to have been referred to, as it opens a new and easy field of investigation to the microscopists.

The chapters devoted to those divisions of the animal kingdom which present objects of interest for microscopical research are well illustrated, and have been brought fairly up to the mark. The illustrations of Foraminifera are very good. The subject of Eozoon might perhaps have been better treated of in the chapter on geological investigation, and from the manual point of view is a little too controversial. We find no reference to the occurrence of calcareous algæ in a fossil state, and yet this is a subject which ought to command the attention of some of our microscopical workers.

Nothing that we have written must be taken as detracting from the extreme usefulness of this volume, which has for so long a period of time supplied an existing want.

Of a somewhat different type is Mr. George E. Davis's "Practical Microscopy." This author's object is to supply a book upon the lines of the late Prof. Quekett's "Practical Treatise on the Use of the Microscope," and his book treats of the forms of microscopical stand, of eye-pieces and objectives, of test objects, of section-cutting, and of the preparation and mounting of objects. In a chapter on the delineation of objects, a very detailed account is given of the subject of "photomicrography;" dry plates are preferred, and the various methods of using the camera are described, and the different modes of development are given. This volume will prove extremely useful to most practical workers, and the illustrations are both numerous and effective.

OUR BOOK SHELF

Elemente der Anatomie und Physiologie der Pflanzen.
von Dr. Julius Wiesner. 276 pp.; 101 woodcuts.
(Vienna: Hölder, 1881.)

THIS book is intended, as the preface tells us, to act as a syllabus or skeleton of Prof. Wiesner's lectures, thus sparing his students the labour of writing out full notes, and allowing them to give their intelligent attention to what is being said. The pretensions of the book are thus humble enough, and are, we think, well carried out.

The anatomy of plants is treated of in 153 pages, and into this space a great deal of matter is crowded. The style is simple and straightforward, and the author does not attempt to render his subject-matter easy by the slipshod method sometimes called popular. From the nature of the book it must necessarily have somewhat the character of a catalogue; but the monotony which might be expected is not by any means a prominent fault. The numerous original drawings are from the hand of Dr. Wichmann, a pupil of Wiesner's, and are extremely well executed, though they lack the peculiar charm which we find in Sach's illustrations, and almost nowhere else. It is refreshing to meet with so large a proportion of original illustrations, instead of the usual reprints, and in this respect the book contrasts favourably with more ambitious works. How far the divisions into which the presentation of the anatomy falls will prove acceptable to professional anatomists, seems to us somewhat doubtful.

The physiological section of the book is, in some ways, probably, better than the first part, since it is the work of a physiologist in his own department. On the other hand, such a subject as physiology does not so well bear the somewhat abrupt treatment necessary in a work like the present. Again, Wiesner's standpoint in physiology is not attractive to many people, nor is it a very commonly accepted one. Few teachers, for instance, would wish their students to learn that negative heliotropism is due to the existence of negatively heliotropic elements. Yet this theory is the only one compatible with the somewhat obscure treatment of negative heliotropism here given.

Sounds and their Relations. By Alexander Melville Bell.
(London: Trübner and Co., 1882.)

MR. MELVILLE BELL'S name is a sufficient guarantee of the value of his work. His *Visible Speech* formed the starting-point of those recent investigations, both in England and on the Continent, which have thrown so much light upon the nature of sounds. In spite of the many new facts which have been observed and brought together since its first publication, its importance still remains